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APJ 3148
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Re: Application of: Georg WEBER, et al.
Serial No.: 10/520,212
Filed: 11/04/2005
For: RECIPROCATING PISTON MACHINE
Art Unit: 3745
Examiner: Frank D. Lopez

Mail Stop: APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

September 24, 2007

APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37

Sir:

Appellants submit this brief for the consideration of the Board of Patent Appeals and Interferences (the "Board") in support of their appeal of the Advisory Action dated August 9, 2007 and the Final Rejection dated April 23, 2007 in this application. The statutory fee of \$500.00 is submitted concurrently herewith. If any additional fees are deemed to be due at this time, the Assistant Commissioner is authorized to charge payment of the same to Deposit Account No. 50-0552.

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In re application of: **Georg WEBER et al.**
Serial No.: 10/520,212
Filed: January 4, 2005 as national phase of International
Application No. PCT/DE2003/002218, filed July 3, 2003
For: **RECIPROCATING PISTON MACHINE**

Sir:

Transmitted herewith is an **APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37** (10 pages) in the above-identified application.

- [X] Also transmitted herewith are:
[] Petition for extension of time under 37 C.F.R. 1.136
[X] Other: Return Receipt Postcard
- [X] Check(s) in the amount of **\$500.00** is/are attached to cover:
[] Filing fee for additional claims under 37 C.F.R. 1.16
[] Petition fee for extension under 37 C.F.R. 1.136
[X] Other: Appeal Brief filing fee
- [X] The Assistant Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 50-0552.
- [X] Any filing fee under 37 C.F.R. 1.16 for the presentation of additional claims which are not paid by check submitted herewith.
- [X] Any patent application processing fees under 37 C.F.R. 1.17.
- [X] Any petition fees for extension under 37 C.F.R. 1.136 which are not paid by check submitted herewith, and it is hereby requested that this be a petition for an automatic extension of time under 37 CFR 1.136.

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I hereby certify that the documents referred to as attached therein and/or transmitted herewith and/or fee(s) are being deposited with the United States Postal Service as "first class mail" with sufficient postage in an envelope addressed to "Mail Stop: APPEAL BRIEF - PATENTS Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450" on September 24, 2007.

DAVIDSON, DAVIDSON & KAPPEL, LLC

BY:
Danielle C. Sullivan

1. REAL PARTY IN INTEREST

The real party in interest is Luk Fahrzeug-Hydraulik GmbH & Co., a German corporation having a place of business in Bad Homburg, Germany, and the assignee of the entire right, title and interest in the above-identified patent application. The invention was assigned to Luk Fahrzeug-Hydraulik GmbH & Co. by an assignment originating from inventors Kent Georg Weber and Jan Hinrichs. The most recent conveyance was recorded on November 4, 2005 at reel 017166, frame 0917.

2. RELATED APPEALS AND INTERFERENCES

Appellants, their legal representatives, and assignee are not aware of any appeal or interference that directly affects, will be directly affected by, or will have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

Claims 15 to 31 are pending. Claims 1 to 14 have been canceled without prejudice. Claims 15 to 24 have been finally rejected as per the Final Office Action dated April 23, 2007. Claims 25 to 31 have been objected to as per the Final Office Action dated April 23, 2007.

The rejection to claims 15 to 24 thus is appealed. A copy of appealed claims 15 to 24 is attached hereto as Appendix A. Applicant reserves the right to place the objected claims in independent form.

4. STATUS OF AMENDMENTS

In response to the Final Office Action dated April 23, 2007, no amendments have been made.

A Notice of Appeal was filed on July 19, 2007, and received by the U.S.P.T.O. on July 23, 2007.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 15 recites a reciprocating piston-type machine, comprising: a housing (for example, housing 1 in Figure 1; for example, page 2, paragraph [0022], line 2 or for example substantially tubular housing 20 in Figure 2; for example, page 5, paragraph [0024], line 2), a housing cover (for example, front housing cover 21 in Figure 2; for example, page 5, paragraph [0024], line 3), a power unit disposed in the housing and including a plurality of pistons (for example, page 4, paragraph [0022], lines 5 to 7), one of a suction and discharge area (for example, page 4, paragraph [0023], lines 1 to 6) and a forward shaft bearing (for example, drive shaft 6 in Figure 1) disposed in the housing cover, and a screw connection configured to screw-couple the housing cover to the housing (for example, thread 22, substantially tubular housing 20 and front housing cover 21 in Figure 2; for example, page 5, paragraph [0024], lines 2 to 3), the screw connection including sawtooth thread (for example, Figure 4) between the housing and the housing cover (for example, page 5, paragraph [0025], lines 3 to 4).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 15 to 24 should be rejected under 35 U.S.C. §103 as being unpatentable over either Olson (US 3,552,886) or Morita et al. (US 2002/0039531) in view of Schorr et al. (US 2002/0129603).

7. ARGUMENTS

35 U.S.C. 103 Rejections

Claims 15 to 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over either Olson (US 3,552,886) or Morita et al. (US 2002/0039531) in view of Schorr et al. (US 2002/0129603).

Olson shows a compressor unit with self-contained drive means. Figure 1 of Olson shows “a housing 10 with a main smooth bore bounded by a series of internal threads 11 around

an annular surface at one end and by an inturned flange 12 at the opposite end” (col. 3, lines 15 to 18 of Olson). “The internal threads 11 mate with the external threads 13 formed in an annular retaining ring 14, which, when threaded into the housing end, may compress an O-ring 15 tightly against the outturned annular shoulder 16 of an end bell 17” (col. 3, lines 18 to 23 of Olson).

Morita et al. shows a “refrigerant compressor [that] includes a cylinder block, a front housing, and a sealing member” (Abstract of Morita et al.). “In compressor 100, front housing 6 and cylinder block 1 are joined by engaging external thread 6a of front housing 6 with internal thread 1b of cylinder block 1” (Specification at [0021] of Morita et al.). “The joint portion between external thread 6a and internal thread 1b is sealed by O-ring 10” (id.). “The strength of the joint portion between front housing 6 and cylinder block 1 may be increased by adjusting a height of the thread, a pitch of the thread, the number of threads of external thread 6a and internal thread 1b, or combination thereof” (id.).

Schorr et al. shows a device to reduce vibrations in a hydraulic force transfer system. “[A] design is preferred according to which the cover is attached to the housing by means of a threaded connection” (Specification at [0016] of Schorr et al.). “Such a threaded connection firstly allows easy replacement of the membrane” (id.). “The threaded connection is preferably structured as both a sawtooth and a round thread” (Specification at [0017] of Schorr et al.). In addition the threaded connection described above has advantages in that due to the sawtooth thread-like structure on the internal diameter of the thread profile on the housing a greater thread bearing depth can be achieved than with a conventional trapezoid thread, whereas the round thread-like structure on the external diameter of the thread profile on the housing ensures a reduction in notch effect in comparison with conventional trapezoid thread, which is particularly important for the durability of the housing when plastic is used as a housing material” (id.).

Claim 15 recites “a reciprocating piston-type machine, comprising:

a housing;

a housing cover;

a power unit disposed in the housing and including a plurality of pistons;

one of a suction and discharge area and a forward shaft bearing disposed in the housing cover; and

a screw connection configured to screw-couple the housing cover to the housing, the screw connection including saw tooth thread between the housing and the housing cover.”

As admitted in the Office Action, neither Olson nor Morita et al. shows a “sawtooth thread” as recited in claim 15. Morita discloses generic teeth. It is clear to one skilled in the art that Morita is speaking of conventional teeth and not specifically saw teeth. Furthermore, Morita et al. asks for “increasing a height (depth) of a thread, to increase joint strength,” but specifically does not teach changing a shape of the teeth. This teaches away from using saw teeth to strengthen a joint, as increasing height does not result in saw teeth. With saw teeth, no height need be changed. It is respectfully submitted that it would not have been obvious to combine the saw teeth of Schorr et al. with the Morita et al. or Olson references.

But even if it would have been prima facie obvious to combine/ modify Morita (which it is not) this prima facie case of obviousness can be rebutted by secondary considerations. See MPEP 2141.

Saw teeth threadings have been known for a long time for use in thermal fluid devices (See U.S. Patent Nos. 2,424,738 and 3,450,298, submitted herewith), as have compressors (See U.S. Pat. No. 3,552,886 submitted herewith) as the Examiner has admitted. This is objective evidence which is submitted herewith, that no one until the present invention was able to solve the long felt problem of increased joint strength in compressors by using saw teeth as claimed. Thus, it is respectfully submitted that any prima facie case of non-obviousness has been rebutted.

Withdrawal of the rejection to claims 15 to 24 is respectfully requested.

CONCLUSION

It is respectfully submitted that the application is in condition for allowance. Favorable consideration of this appeal brief is respectfully requested.

Respectfully submitted,

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APPENDIX A:

PENDING CLAIMS 15 to 24 OF U.S.
APPLICATION SERIAL NO. 10/520,212

Claim 15 (original): A reciprocating piston-type machine, comprising:

- a housing;
- a housing cover;
- a power unit disposed in the housing and including a plurality of pistons;
- one of a suction and discharge area and a forward shaft bearing disposed in the housing cover; and
- a screw connection configured to screw-couple the housing cover to the housing, the screw connection including sawtooth thread between the housing and the housing cover.

Claim 16 (original): The reciprocating piston-type machine as recited in claim 15, wherein the machine includes a compressor.

Claim 17 (original): The reciprocating piston-type machine as recited in claim 16, wherein the compressor is part of an air conditioning system of a motor vehicle.

Claim 18 (original): The reciprocating piston-type machine as recited in claim 15, wherein the screw connection includes a first thread side disposed on the housing and a second thread side disposed on the housing cover.

Claim 19 (original): The reciprocating piston-type machine as recited in claim 15, wherein, in response to an axial compressive load on the cover, the sawtooth thread creates a stress in a radial direction substantially less than a hypothetical stress in the radial direction created by a triangular thread.

Claim 20 (original): The reciprocating piston-type machine as recited in claim 15, wherein a tightening torque required to screw-couple the housing cover to the housing is less than a tightening torque for a triangular thread.

Claim 21 (original): The reciprocating piston-type machine as recited in claim 15, wherein, as compared to a triangular thread, a thermal stress in the screw connection is less.

Claim 22 (original): The reciprocating piston-type machine as recited in claim 15, wherein, in comparison to a triangular thread, a loading on the housing is less.

Claim 23 (original): The reciprocating piston-type machine as recited in claim 15, wherein a wall thickness of the housing is smaller and a thread length is shorter as compared to a triangular thread.

Claim 24 (original): The reciprocating piston-type machine as recited in claim 15, wherein a weight of at least one of the housing and the housing cover is less than a minimum weight of a housing and housing cover coupled using a triangular thread.

APPENDIX B

Evidence Appendix under 37 C.F.R. §41.37(c)(ix):

No evidence pursuant to 37 C.F.R. §§1.130, 1.131 or 1.132 and relied upon in the appeal has been submitted by appellants or entered by the examiner.

APPENDIX C

Related proceedings appendix under 37 C.F.R. §41.37(c)(x):

As stated in “2. RELATED APPEALS AND INTERFERENCES” of this appeal brief, appellants, their legal representatives, and assignee are not aware of any appeal or interference that directly affects, will be directly affected by, or will have a bearing on the Board’s decision in this appeal.